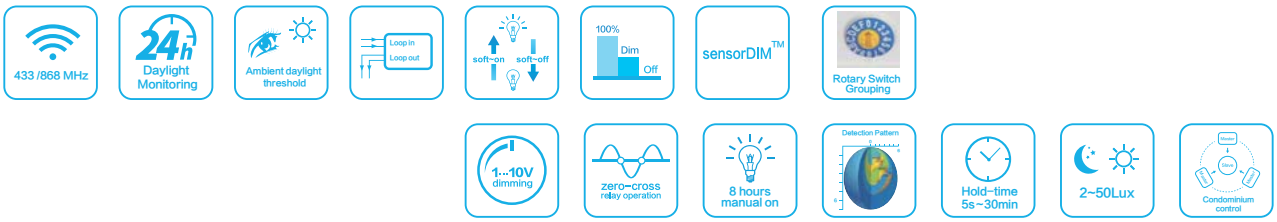
Sensors with RF Wireless Transmission Control

Model: HC028V/RF, HC018V/RF HC023RF, HC024RF

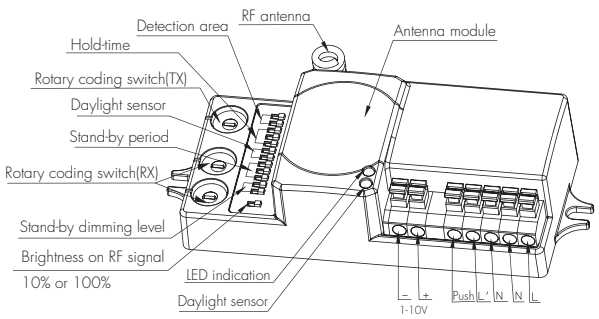
This is a combination of motion sensor and RF radio wave wireless transmission, which is perfect solution for retrofit projects. The motion detected by 1 sensor (the master unit) can pass onto other pre-defined individuals (the slave units) though RF transmission. The master can trigger unlimited number of slaves as long as within the transmission range (30 meters indoor and 100 meters in the open area).

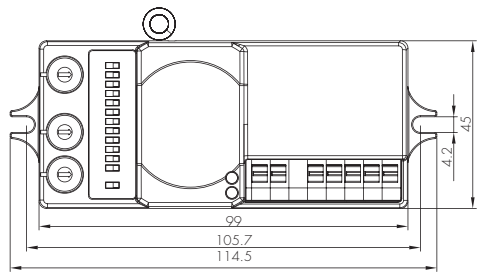
With fixed address code technology, it's easy to set up transmission groups. Up to 16 different groups can be created. Optional transmission frequency of 433/868 MHz, thanks to FSK technology. Easy installation and free of wiring!

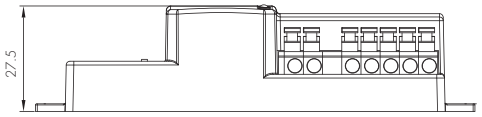


RF Transceiver HC028V/RF

*can serve as both master and slave

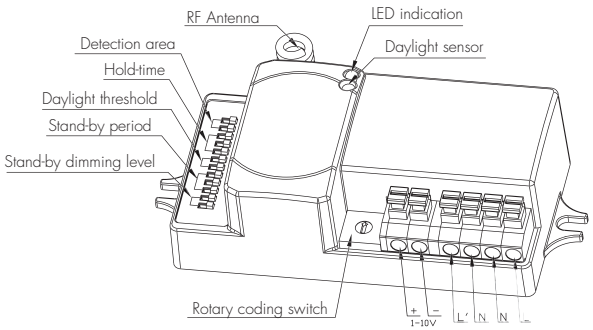


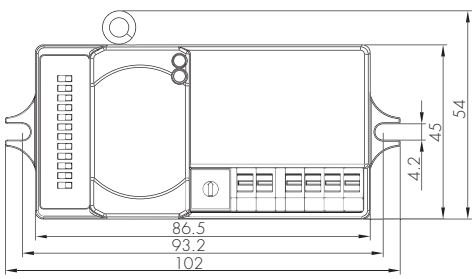


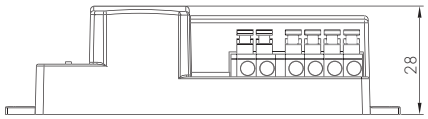


RF Transmitter HC018V/RF

*master only

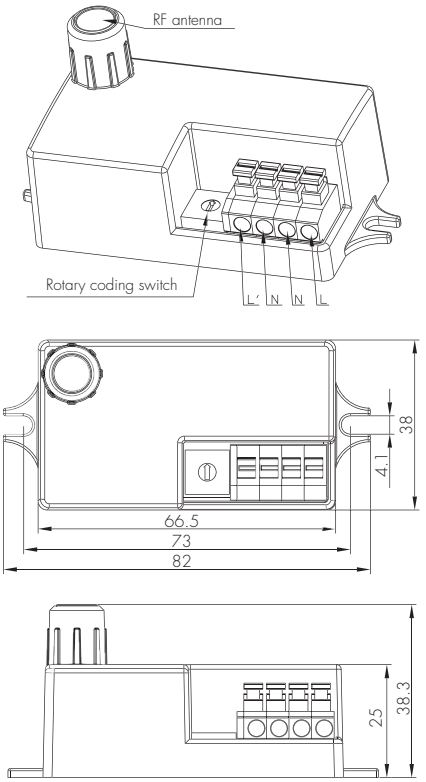






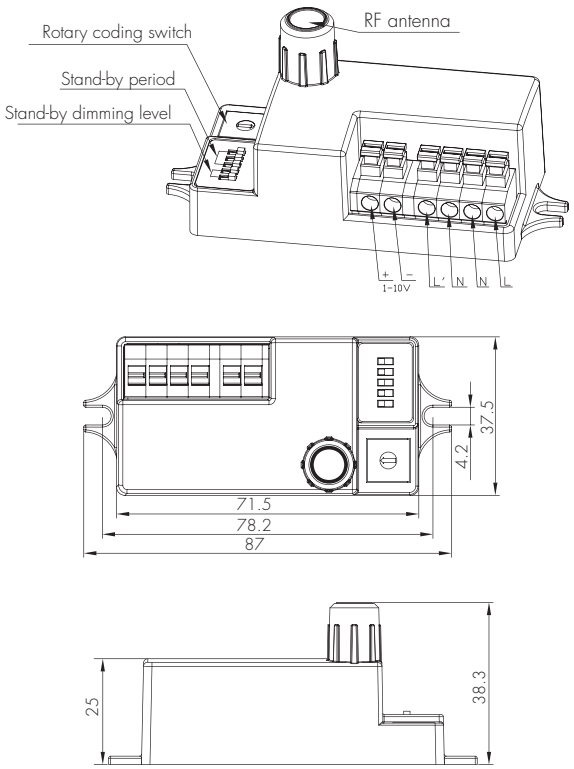
RF Receiver HC023RF

*slave, on-off control



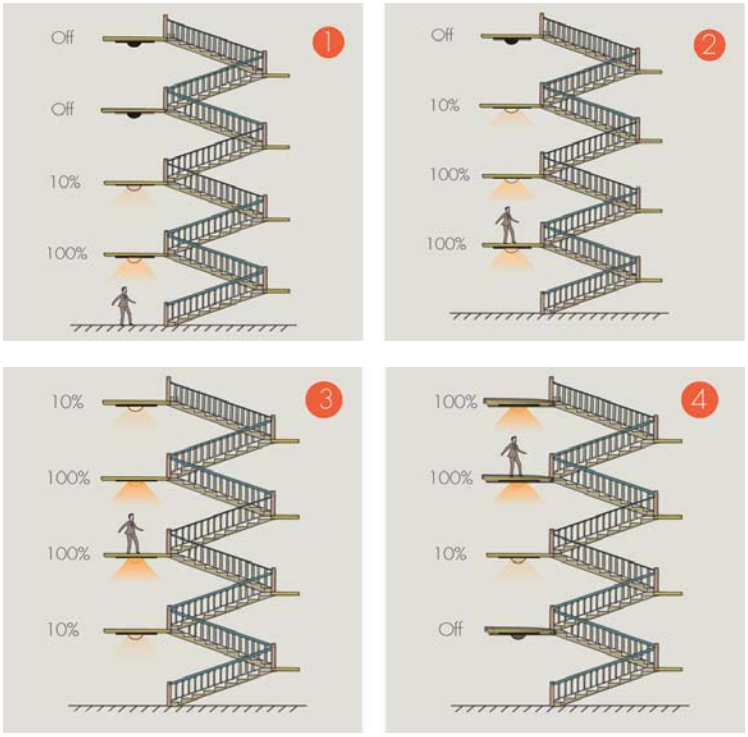
RF Receiver HC024RF

*slave, dimming control



Typical Applications

1 For staircase (HC028V/RF serves as both master and slave)



1. The 1st sensor detects motion, it turns the light on 100% and sends signal to the 2nd sensors at the same time. The 2nd light is switched to stand-by brightness.

2. The person walks to the 2nd floor, the 2nd sensor turns on the light 100%, meanwhile, the 3rd light is switched to stand-by brightness.

3. The person walks to the 3rd floor, the 3rd sensor turns on the light 100%, meanwhile, the 4th light is switched to stand-by brightness. The 1st light is dimmed to stand-by brightness after hold-time.

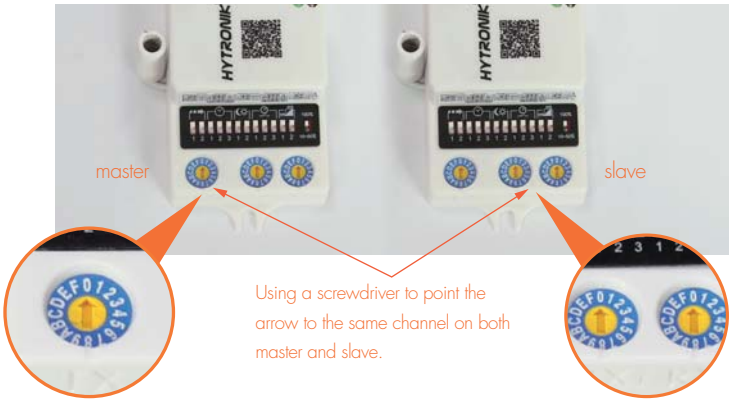
4. The person walks to the 4th floor, the 4th sensor turns on the light 100%, meanwhile, the next light is switched to stand-by brightness. The 1st light is off after stand-by period and the 2nd light is dimmed to stand-by brightness.

Note: by selecting the brightness DIP switch, the slave can either turn the light 100% on or dim the light to stand-by dimming level upon receiving the RF signal from the master.

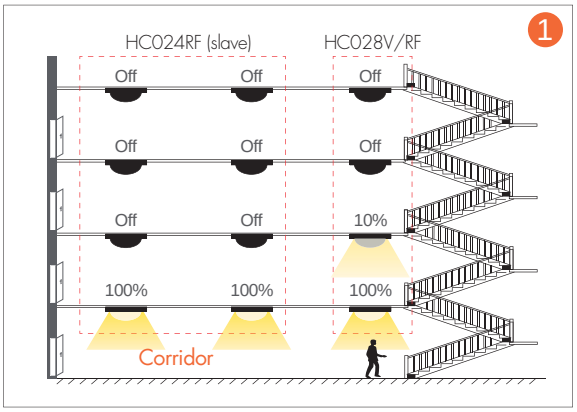
RF Grouping (Maximum 16 channels)

Using a screwdriver to adjust the rotary switch on both the tranmiter unit (master) and receiving unit (slave), and keep them pointing at the same channel, the grouping is automatically completed. 16 channels (maximum 16 groups) available for both the master & slave unit.

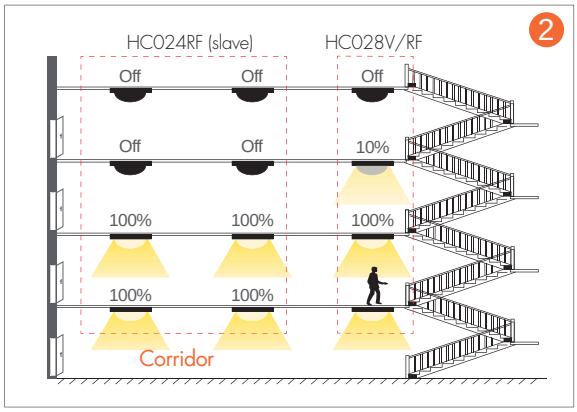
Note: RX1 and RX2 receive two different RF signals from two different masters.



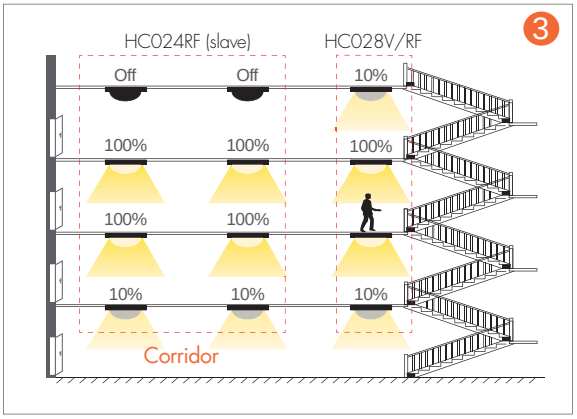
2 For staircase and corridor (HC028V/RF as both master and slave, HC024RF as slave)



While the 1st sensor detects motion on the 1st floor, it switches the light on 100% and sends signal to all slave units. All HC024RF on the 1st floor turn on 100% and the HC028V/RF on the 2nd floor goes to stand-by level.

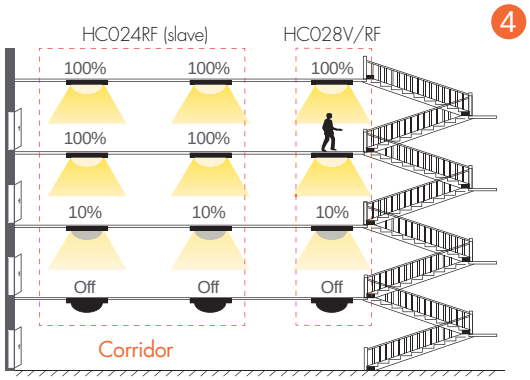


The person walks to the 2nd floor, the 2nd HC028V/RF switches the light on 100%. All HC024RF on the 2nd floor turn the light on 100% and the HC028V/RF on the 3rd floor goes to stand-by level.



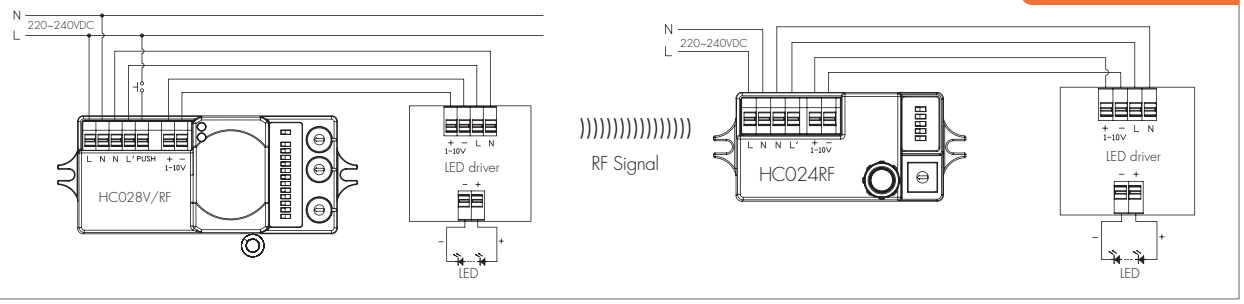
When walks to the 3rd floor, the 3rd HC028V/RF switches the light on 100%. All HC024RF on the 3rd floor turn the light on 100% and the HC028V/RF on the 4th floor goes to stand-by level. Meanwhile, the lights on the 1st floor are dimmed to stand-by level after hold-time.

Note: the lights in the corridor go off directly after hold-time when controlled by HC023RF.



The person walks to the 4th floor, the 4th HC028V/RF switches the light on 100%. All HC024RF on the 4th floor turn the ligh on 100% and the next HC028V/RF goes to stand-by level. Meanwhile, all sensors on the 1st floor turn the light off after stand-by period, and all lights on the 2nd floor dim to stand-by level after hold-time.

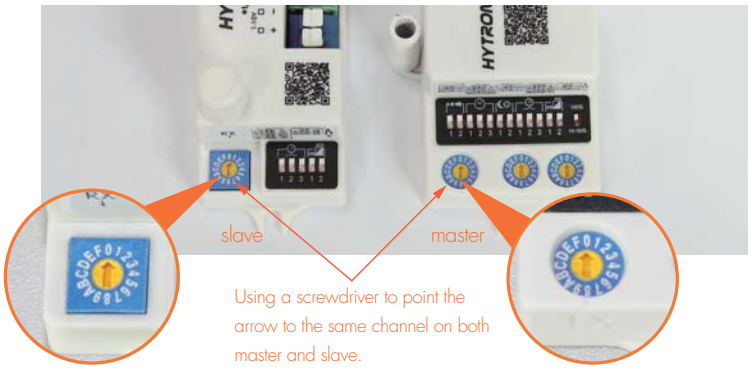
Wiring Diagram



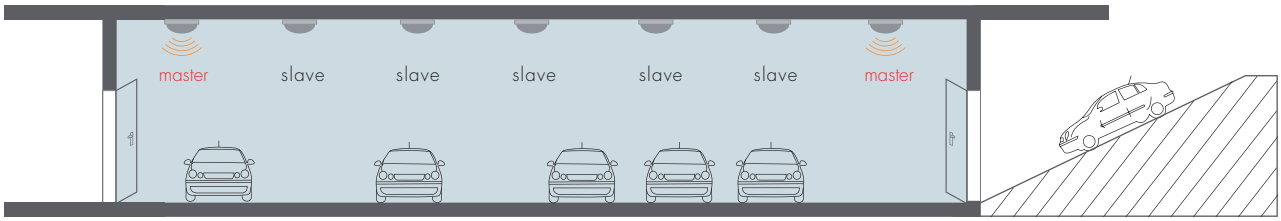
Note: this 1-10V output on the master unit HC028V /RF is isolated, SELV output.

RF Grouping (Maximum 16 channels)

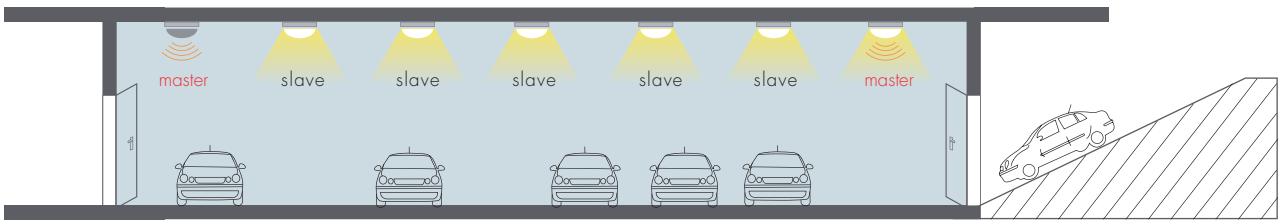
Using a screwdriver to adjust the rotary switch on both the tranmiter unit (master) and receiving unit (slave), and keep them pointing at the same channel, the grouping is automatically completed. 16 channels (maximum 16 groups) available for both the master & slave unit.



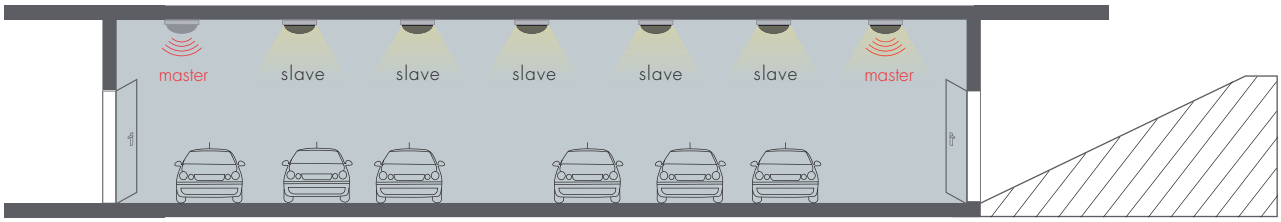
3 For carpark (HC018V/RF as master and HC024RF as slave)



With sufficient natural light, the sensor is not triggered by motion.

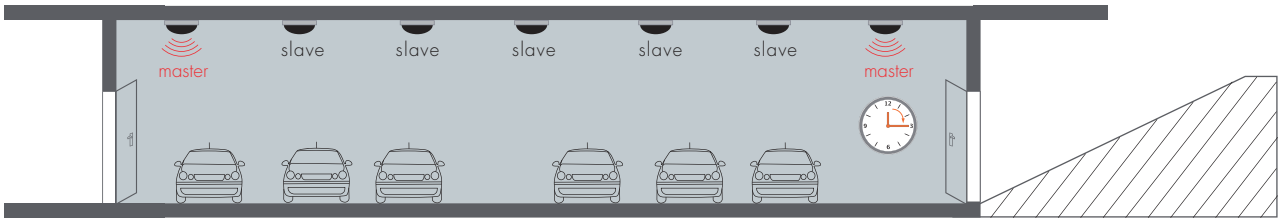


With insufficient natural light, the sensor is triggered by motion, the master switches on the light and send RF signal to all salves.



After the hold-time, the whole group of lamps dim to pre-defined dimming level when no movement detected.

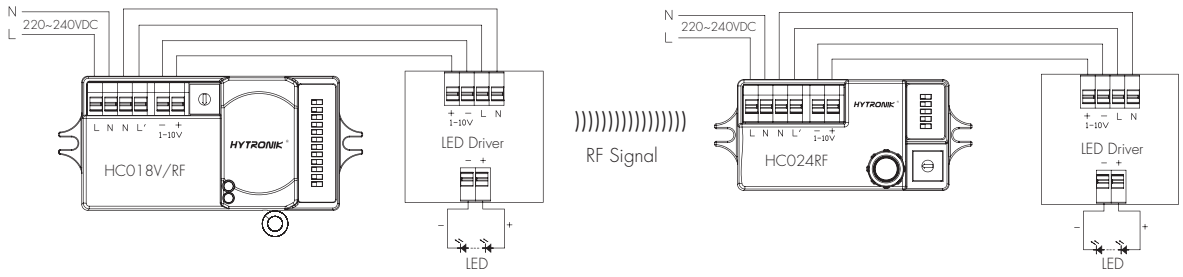
Note: the lights go off directly after hold-time when controlled by HC023RF.



The whole group of lamps switch off automatically after the stand-by period.

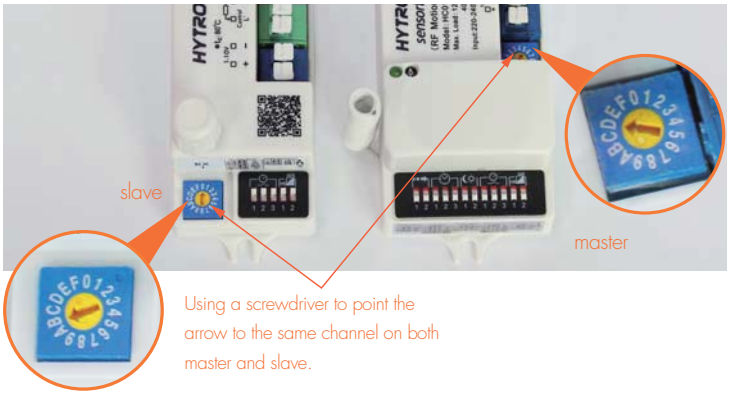
Note: even in case the slave fails to receive the off signal from the master, it will also switch the light off automatically after a 30min time delay.

Wiring Diagram



RF Grouping (Maximum 16 channels)

Using a screwdriver to adjust the rotary switch on both the tranmiter unit (master) and receiving unit (slave), and keep them pointing at the same channel, the grouping is automatically completed. 16 channels (maximum 16 groups) available for both the master & slave unit.



Using a screwdriver to point the arrow to the same channel on both master and slave.

Functions and Options

1 8H manual on mode for LED lamp

Rapidly turn off/on the power supply three times within 3 seconds, the light will be 100% on for 8 hours, and then goes to sensor mode automatically after 8 hours. Useful when sensor function is not needed in special occasion.

Note: this 8H manual on mode can be cancelled by turning off/on the power supply one time within 1second.

2 Ambient daylight threshold

Switch the power supply to the sensor two times within 2 seconds, the sensor can set the ambient lux level as the new threshold. Both the settings on DIP switch and the ambient lux threshold learned can overwrite each other.

This feature enables the daylight sensor to be commissioned to the environment in which it is installed. The latest action controls. (More details of the operation procedure please refer to user manual).

3 Zero-cross relay operation

Designed in the software, sensor switches on/off the load right at the zero-cross point, to ensure the in-rush current is minimised, enabling the maximum lifetime of the relay.

4 Loop-in and loop-out terminal

Double L N terminal makes it easy for wire loop-in and loop out, and saves the cost of terminal block and assembly time.

5 Manual override (for HC028V/RF only)

This sensor reserves the access of manual override function for end-user to switch on/off, or adjust the brightness by push-switch, which makes the product more user-friendly and offers more options to fit for some extra-ordinary demands:

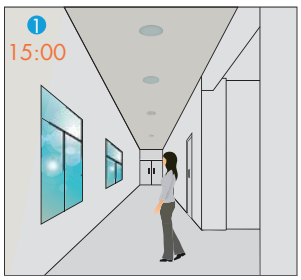
* Short push (<1s): on/off function;
  On → off: the light turns off immediately and can not be lighten for a certain time (equals to hold-time preset) even movement is detected. After this period, the sensor goes to sensor mode.
  Off → on: the light turns on and goes to sensor mode, no matter if ambient Lux level exceeds the daylight threshold or not. Meanwhile, it will send RF signal to all slaves.
* Long push (>1s): dim up/down the hold-time brightness between 10% and 100%. Both the settings on DIP switch and manual override can overwrite each other, the latest action controls.

Note: if end-user do not want this manual override function, just leave the "push" terminal alone and don't connect it to any wire.

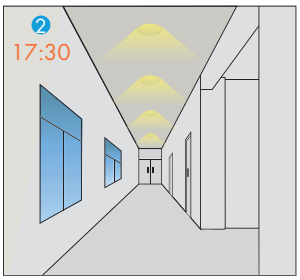
6 Daylight monitoring function (for HC028V/RF and HC018V/RF)

Hytronik specially designed this function in software for deep energy-saving purpose:

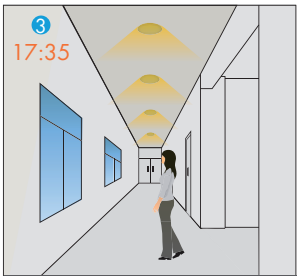
1. With sufficient natural light, the light won't turn on when motion detected. However, the master still sends out RF signals to slave unit(s).
2. After hold-time, the light turns off completely if surrounding natural light is sufficient.
3. When stand-by period is preset at "+∞", the light will turn off completely when surrounding natural light is sufficient during stand-by period, and turn on at dimming level automatically when natural light is below daylight threshold.



With sufficient natural light, the light does not switch on even there is movement detected.

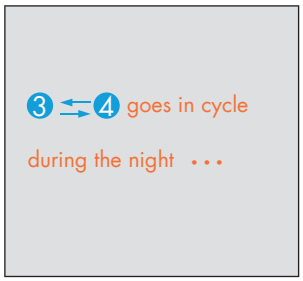


At dusk,as the natural light drops below threshold value, the sensor turns on the light at the dimmed level.

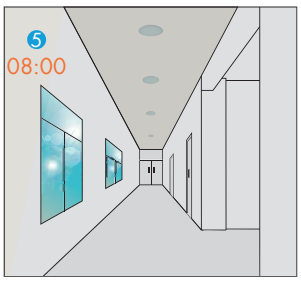


The light switches on at 100% when there is movement detected.

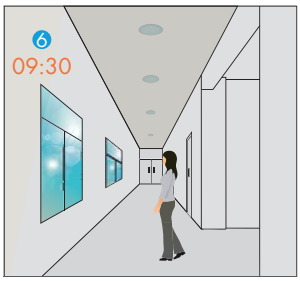
Light dims to stand-by level after the hold-time.



100% on when movement detected, and dims to10% in long absence.



At dawn, light turns off completely when natural light reaches above daylight threshold.

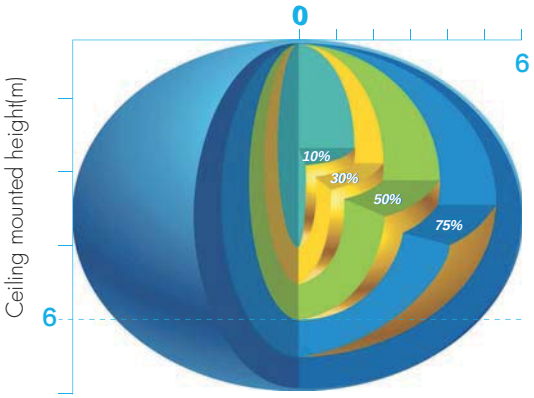


Light does not switch on even when movement detected during the daytime.

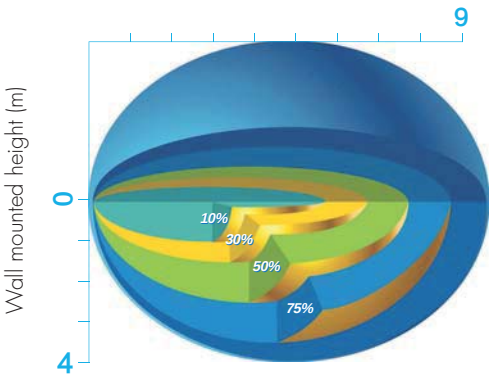
Settings on this demonstration:

Hold-time	10min
Daylight threshold	50lux
Stand-by period	+∞
Stand-by dimming level	10%

Detection Pattern



Ceiling mounted detection pattern (m)



Wall mounted detection pattern (m)

Settings (HC028V/RF)

❶ Detection area

Detection area can be reduced by selecting the combination on the DIP switches to fit precisely for each specific application.

	1	2	
I	●	●	100%
II	●	○	75%
III	○	●	50%
IV	○	○	10%

I – 100%
II – 75%
III – 50%
IV – 10%

❷ Hold-time

Hold-time means the time period you would like to keep the lamp on 100% after the person has left the detection area.

	1	2	3	
I	●	●	●	5s
II	●	●	○	30s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	20min
VII	○	○	○	30min

I – 5s
II – 30s
III – 1 min
IV – 5 min
V – 10 min
VI – 20 min
VII – 30 min

❸ Stand-by period (corridor function)

This is the time period you would like to keep at the low light output level before it is completely switched off in the long absence of people.

Note: "0s" means on/off control;
"+∞ "means bi-level dimming control, fixture never switches off when daylight sensor is disabled.

	1	2	3	
I	●	●	●	0s
II	●	●	○	10s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	30min
VII	○	○	●	1h
VIII	○	○	○	+∞

I – 0s
II – 10s
III – 1min
IV – 5 min
V – 10 min
VI – 30 min
VII – 1H
VIII – +∞

❹ Stand-by dimming level

This is the dimmed low light output level you would like to have after the hold-time in the absence of people.

Note: the stand-by period and stand-by dimming level set up on the master is only valid for the master unit; the slave unit can set its own stand-by period and dimming level.

	1	2	
I	●	●	10%
II	●	○	20%
III	○	●	30%
IV	○	○	50%

I – 10%
II – 20%
III – 30%
IV – 50%

❺ Daylight sensor

The daylight threshold can be set on DIP switches, to fit for particular application.

	1	2	
I	●	●	Disable
II	●	○	50Lux
III	○	●	10Lux
IV	○	○	2Lux

I – Disable
II – 50Lux
III – 10Lux
IV – 2Lux

Note: end-user can also scan the QR code on the housing for DIP switch settings.

Technical Data (HC028V/RF)	
Operating voltage	220-240VAC
Switched power	400W
Coding	Fixed address coding (rotary coding switch for grouping)
Detection area	10% /50% /75% /100%, can be customized
Hold-time	5s/30s/1min/5min/10min/20min/30min, can be customized
Stand-by period	0s/10s/1min/5min/10min/30min/1hour / +∞
Daylight threshold	2~50 lux, disable, can be customized
RF. Communicatin Channels	16 channels for grouping
Microwave frequency	5.8GHz+/-75MHz
Microwave power	<0.2mW
Detection range	Max. (DxH): 12m x 6m
Detection angle	30~150°
RF. Transmission distance	30 meters indoor, 100 meters in the open area
Mounting height	Max. 6m
Tc	80°C
RF frequency	433/ 868 MHz (FSK mode)
Certificate	Semko, CB, EMC, CE, R&TTE, SAA

Settings (HC018V/RF)

1 Detection area

Detection area can be reduced by selecting the combination on the DIP switches to fit precisely for each specific application.

	1	2	
I	●	●	100%
II	●	○	75%
III	○	●	50%
IV	○	○	10%

I – 100%
II – 75%
III – 50%
IV – 10%

2 Hold-time

Hold-time means the time period you would like to keep the lamp on 100% after the person has left the detection area.

	1	2	3	
I	●	●	●	5S
II	●	●	○	30S
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	20min
VII	○	○	○	30min

I – 5S
II – 30S
III – 1 min
IV – 5 min
V – 10 min
VI – 20 min
VII – 30 min

3 Daylight sensor

The daylight threshold can be set on DIP switches, to fit for particular application.

	1	2	
I	●	●	Disable
II	●	○	50 lux
III	○	●	10 lux
IV	○	○	2 lux

I – Disable
II – 50 lux
III – 10 lux
IV – 2 lux

4 Stand-by period (corridor function)

This is the time period you would like to keep at the low light output level before it is completely switched off in the long absence of people.

Note: "0s" means on/off control;
"+∞" means bi-level dimming control, fixture never switches off when daylight sensor is disabled.

	1	2	3	
I	●	●	●	0S
II	●	●	○	10S
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	30min
VII	○	○	●	1h
VIII	○	○	○	+∞

I – 0S
II – 10S
III – 1 min
IV – 5 min
V – 10 min
VI – 30 min
VII – 1 h
VIII – +∞

5 Stand-by dimming level

This is the dimmed low light output level you would like to have after the hold-time in the absence of people.

Note: the stand-by period and stand-by dimming level set up on the master is only valid for the master unit; the slave unit can set its own stand-by period and dimming level.

	1	2	
I	●	●	10%
II	●	○	20%
III	○	●	30%
IV	○	○	50%

I – 10%
II – 20%
III – 30%
IV – 50%

Technical Data (HC018V/RF)	
Operating voltage	220~240VAC
Switched power	Capacitive:400W
Stand-by power	<0.5W (HC018V/RF)
Coding	Fixed address coding (rotary coding switch for grouping)
Detection area	10/50/75/100%, can be customized
Hold-time	5s/30s/1min/5min/10min/20min/30min, can be customized
Daylight threshold	2~50Lux, disable, can be customized
RF. Communicatin Channels	16 channels for grouping
Microwave frequency	5.8GHz +/-75MHz
Microwave power	<0.2mW
Detection range	Max. (∅ x H): 12m x 6m
Detection angle	30~150°
RF. Transmission distance	30 meters indoor, 100 meters in the open area.
Mounting height	Max. 6m
Operating temperature	-35°C ~ +70°C
RF frequency	433 MHz (FSK mode)
Certificate	Semko, CB, EMC, CE, R&TTE, SAA

Settings (HC024RF)

Stand-by period (corridor function)

This is the time period you would like to keep at the low light output level beforeit is completely switched off in the longabsence of people.

Note: "0s" means on/off control;
"+∞"means bi-level dimming control, fixture never switches off.

	1	2	3	
I	●	●	●	0s
II	●	●	○	10s
III	●	○	●	1min
IV	●	○	○	5min
V	○	●	●	10min
VI	○	●	○	30min
VII	○	○	●	1h
VIII	○	○	○	+∞

I – 0s
II – 10s
III – 1 minute
IV – 5 minutes
V – 10 minutes
VI– 30 minutes
VII– 1 hour
VIII– +∞

Stand-by dimming level

This is the dimmed low light output level you would like to have after the hold-time in the absence of people.

	1	2	
I	●	●	10%
II	●	○	20%
III	○	●	30%
IV	○	○	50%

I – 10%
II – 20%
III – 30%
IV – 50%

Note: end-user can also scan the QR code on the housing for DIP switch settings.